

Claims

1. An air intake system for an engine of a work vehicle, comprising:
a heat exchanger package, the heat exchanger package including at least one heat exchanger;
a baffle;
at least one side door;
a top door;
a fan door;
a floor, the baffle, the at least one side door, the top door and the fan door forming a plenum cooling compartment, the baffle separating the plenum cooling compartment from the engine, the at least one heat exchanger being located at a rear end of the plenum cooling compartment, a distance between the heat exchanger package and the baffle forming a gap through which ambient air flows;
and
an engine air intake device, the engine air intake device removing a first portion of the ambient air flowing through the gap, removing debris from the first portion of the ambient air to produce clean air and supplying the clean air to the engine.
2. The air intake system of claim 1, wherein the engine air intake device comprises an air intake tube for removing the first portion of the ambient air from the gap.
3. The air intake system of claim 2, wherein the engine air intake device further comprises an air cleaner, the air intake tube supplying the first portion of the ambient air to the air cleaner, the air cleaner removing debris from the first portion of the ambient air to produce clean air and supplying the clean air to the engine.
4. The air intake system of claim 2, wherein the air intake tube is routed through a hole in the baffle.
5. The air intake system of claim 1, further comprising at least one side door, the at least one side door having a first perforated screen for removing large debris from the ambient air before the ambient air enters the plenum cooling compartment.

6. The air intake system of claim 5, further comprising a top door having a second perforated screen for removing large debris from the ambient air before the ambient air enters the plenum cooling compartment.
7. The air intake system of claim 6, further comprising a fan door, the fan door including a fan for removing a second portion of the ambient air from the plenum cooling compartment via the at least one heat exchanger.
8. The air intake system of claim 1, further comprising a fan, the fan causing a second portion of the ambient air to move from an area inside the plenum cooling compartment to an area outside the plenum cooling compartment.
9. The air intake system of claim 8, wherein the fan causes the second portion of the ambient air to flow through the at least one heat exchanger.
10. The air intake system of claim 3, wherein the air intake device further comprises an output tube, the output tube supplying clean air from the air cleaner to the engine.
11. A convertible engine air intake system for a work vehicle, comprising:
 - a plenum cooling package, the plenum cooling package including:
 - a fan;
 - at least one heat exchanger;
 - a top door;
 - a floor;
 - at least one side door, at least one of the top door and the at least one side door having perforations; and
 - a baffle, the at least one heat exchanger, the top door, the floor, the at least one side door and the baffle forming a plenum cooling compartment, the baffle separating the plenum cooling compartment from the engine, the fan moving a first ambient air from a first area outside the plenum cooling compartment into the plenum cooling compartment via the perforations to form ambient plenum air, the fan moving a first portion of the ambient plenum air through the at least one heat exchanger to an area outside the plenum cooling compartment; and
 - an engine air intake device removing a second portion of the ambient plenum air and supplying it to the engine, the engine air intake device capable of removing a

second ambient air from a second area outside the plenum cooling compartment and supplying it to the engine.

12. The convertible engine air intake system of claim 11, further comprising an air pre-cleaner located outside the plenum cooling compartment, wherein the engine air intake device removes the second ambient air from the second area via the pre-cleaner.

13. The convertible engine air intake system of claim 12, wherein the engine air intake device comprises an air intake tube and an air cleaner.

14. The convertible engine air intake system of claim 13, wherein the baffle includes a baffle inlet area capable of being opened to form a baffle inlet hole through which the air intake tube may be routed the baffle inlet area capable of being closed.

15. The convertible engine air intake system of claim 14, further comprising an engine compartment having a hood, wherein the hood includes a hood inlet area capable of being opened to form a hood inlet hole through which the air intake tube may be routed, the hood inlet area capable of being closed.

16. The convertible engine air intake system of claim 15, wherein the hood inlet area is closed when the air intake tube is routed through the baffle.

17. The convertible engine air intake system of claim 16, wherein the baffle inlet area is closed when the air intake tube is routed through the hood.

18. The convertible engine air intake system of claim 17, wherein the air intake tube may be routed through either of the hood inlet area and the baffle inlet area.

19. The convertible engine air intake system of claim 18, wherein the air cleaner comprises a filter body, the air intake tube being positioned at one of the hood inlet area and the baffle inlet area by rotating the filter body.

20. The convertible engine air intake system of claim 18, further comprising an output tube for supplying the engine with clean ambient air from the air cleaner, wherein the air intake tube is positioned at one of the hood inlet area and the baffle inlet area by rotating the filter body relative to the output tube.

21. A work vehicle having an engine air intake system, the engine air intake system comprising:

a plenum cooling package, the plenum cooling package including:

a fan;

at least one heat exchanger;

a top door;

a floor;

at least one side door, at least one of the top door and the at least one side door having perforations; and

a baffle, the at least one heat exchanger, the top door, the floor, the at least one side door and the baffle forming a plenum cooling compartment, the baffle wall separating the plenum cooling compartment from the engine, the fan moving a first ambient air from a first area outside the plenum cooling compartment into the cooling compartment via the perforations to form ambient plenum air, the fan moving a first portion of the ambient plenum air through the at least one heat exchanger to an area outside the plenum cooling compartment; and

an engine air intake device removing a second portion of the ambient plenum air and supplying it to the engine, the engine air intake device capable of removing a second ambient air from a second area outside the plenum cooling compartment and supplying it to the engine.

22. The work vehicle of claim 21, wherein the engine air intake device comprises an air intake tube for removing the second portion of the ambient plenum air from the gap.

23. The work vehicle of claim 22, wherein the engine air intake device further comprises an air cleaner, the air intake tube supplying the second portion of the ambient plenum air to the air cleaner, the air cleaner removing debris from the second portion of the ambient plenum air to produce clean air and supplying the clean air to the engine.

24. The work vehicle of claim 22, further comprising a gap formed by a distance between the baffle and the at least one heat exchanger, wherein the air intake tube is routed through a hole in the baffle to the gap.

25. The work vehicle of claim 21, wherein the at least one side door includes a first perforated screen that removes debris from the ambient air before the ambient

air enters the plenum cooling compartment.

26. The work vehicle of claim 25, wherein the top door includes a second perforated screen that removes debris from the ambient air before the ambient air enters the plenum cooling compartment.

27. The work vehicle of claim 25, further comprising a fan door, the fan door including the fan.

28. The work vehicle of claim 21, further comprising a fan door, the fan door including the fan.

29. The work vehicle of claim 28, wherein the fan causes all of the ambient plenum air to flow through the at least one heat exchanger.

30. The work vehicle of claim 23, wherein the air intake device further comprises an output tube, the output tube supplying clean air from the air cleaner to the engine.

31. A work vehicle having an engine and an engine air intake system, the engine air intake system comprising:

- a plenum cooling package, the plenum cooling package including:

- a fan;

- at least one heat exchanger;

- a top door;

- at least one side door, at least one of the top door and the at least one side door having perforations; and

- a baffle, the at least one heat exchanger, the top door, the at least one side door and the baffle wall forming a plenum cooling compartment, the baffle separating the plenum cooling compartment from the engine, the fan moving a first ambient air from a first area outside the plenum cooling compartment into the cooling compartment via the perforations to form ambient plenum air, the fan moving a first portion of the ambient plenum air through the at least one heat exchanger to an area outside the plenum cooling compartment, a distance between the heat exchanger and the baffle forming a gap through which ambient air flows; and

- an engine air intake device, the engine air intake device removing a second portion of the ambient plenum air from the gap and supplying it to the engine, the engine air intake device capable of removing a second ambient air from a second

area outside the plenum cooling compartment and supplying it to the engine.

32. The work vehicle of claim 31, further comprising an air pre-cleaner located outside the plenum cooling compartment, wherein the engine air intake device removes the outside ambient air from the second area via the pre-cleaner.

33. The work vehicle of claim 32, wherein the engine air intake device comprises an air intake tube and an air cleaner.

34. The work vehicle of claim 33, wherein the baffle includes a baffle inlet area capable of being opened to form a baffle inlet hole through which the air intake tube may be routed.

35. The work vehicle of claim 34, further comprising a hood having a hood inlet area, the hood inlet area capable of being opened to form a hood inlet hole through which the air intake tube may be routed, the hood inlet area capable of being closed.

36. The work vehicle of claim 35, wherein the hood inlet area is closed when the air intake tube is routed through the baffle inlet hole.

37. The work vehicle of claim 36, wherein the baffle inlet area is closed when the air intake tube is routed through the hood inlet hole.

38. The work vehicle of claim 37, wherein the air intake tube may be routed through either of the hood inlet area and the baffle inlet area.

39. The work vehicle of claim 34, wherein the baffle inlet area comprises a first inlet door.

40. The work vehicle of claim 35, wherein the hood inlet area comprises a second inlet door.

41. A method of obtaining clean engine intake air for a work vehicle, the work vehicle having an engine air intake device and a plenum cooling package, the plenum cooling package including at least one heat exchanger; a floor; a top door; a fan door, the fan door including a fan, the fan moving a first ambient air from a first area outside the plenum compartment, a first debris being removed from the first ambient air as the first ambient air passes through the perforations to form ambient plenum air; a baffle; at least one side door and a hood, the top door and the at least one side door having perforations, the top door, the fan door, the baffle, the at least one side door and the floor forming a plenum cooling compartment, the baffle

separating the plenum cooling compartment from the engine, the plenum cooling compartment containing the at least one heat exchanger, a distance between the at least one heat exchanger and the baffle forming a gap through which ambient plenum air flows, the engine air intake device capable of removing a second portion of the ambient plenum air flowing through the gap and supplying the second portion of the ambient plenum air to the engine, the engine air intake device capable of removing a second ambient air from a second area outside the plenum cooling compartment and supplying the second ambient air to the engine, the method comprising:

- removing a portion of the ambient air from the plenum cooling area with the engine air intake device;

- removing a second debris from the portion of the ambient air via the engine air intake device to produce clean air; and

- supplying the clean air to the engine via the engine air intake device.

42. A method of obtaining clean engine intake air for a work vehicle, the work vehicle having an engine air intake device and a plenum cooling package, the engine air intake device including an air intake tube having an air inlet, an air cleaner and an output tube, the plenum cooling package including at least one heat exchanger; a floor; a top door; a fan door; a baffle; at least one side door and a hood, the floor, the top door, the fan door, the baffle, and the at least one side door forming a plenum cooling compartment, the baffle separating the plenum cooling compartment from the engine, the fan door including a fan, the fan capable of moving a first ambient air from a first area external to the plenum cooling compartment into the plenum cooling compartment to form ambient plenum air, the plenum cooling compartment containing the at least one heat exchanger, a distance between the at least one heat exchanger and the baffle forming a gap through which ambient plenum air flows, the engine air intake device capable of removing a portion of the ambient plenum air flowing through the gap and supplying the portion of the ambient plenum air to the engine, the engine air intake device capable of removing a second ambient air from a second area external to the plenum cooling compartment via a pre-cleaner and supplying the outside ambient air to the engine, the method comprising:

a first procedure for a first level of airborne debris, the first procedure comprising:

- locating the air inlet in proximity to the baffle,
- moving a first ambient air from the first area through the perforations and into the plenum cooling compartment via the fan, a first debris being removed as the ambient air passes through the perforations;

- removing a portion of the ambient air from the gap with the engine air intake device via the air intake tube,

- removing a second debris from the portion of the ambient air via the air cleaner to produce a first clean air, and

- supplying the first clean air to the engine via the output tube;

and

a second procedure for a second level of debris, the second procedure comprising:

- moving a second ambient air from the second area with the engine air intake device via the pre-cleaner and the air intake tube, the pre-cleaner removing a third-debris from the second ambient air,

- removing a fourth debris from the portion of the outside air via the air cleaner to produce a second clean air, and

- supplying the second clean air to the engine via the output tube.

43. The method of claim 42, wherein the second procedure is substituted for the first procedure by removing the air intake tube from a hole in the baffle, closing the hole in the baffle, rotating the air cleaner to orient the air intake tube toward a hole in the hood and routing the air intake tube through the hole in the hood.

44. The method of claim 42, wherein the first procedure is substituted for the second procedure by removing the air intake tube from a hole in the hood, closing the hole in the hood, rotating the air cleaner to orient the air intake tube toward a hole in the baffle and routing the air intake tube through the hole in the baffle.